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ABSTRACT

Of the currently available programs for microcomputers, only a few are applicable for reading instruction, and those being used are most frequently drill and practice. These programs focus on reading skills such as letter recognition, word alphabetization, and sight words. Very few programs are concerned with comprehension. Consequently, a team at the Iowa State University in Ames, consisting of several elementary education faculty, a media specialist, and two programers, produced five microcomputer programs, one of which focuses on the comprehension skill of paraphrasing. The program is designed for use on the Apple II Plus microcomputer and is in two parts: one using regular sentences and the other using sentences with idioms. In each part there are 15 sets of three sentences each. Basically each student is asked to read all three sentences and select the two giving the same thought. To integrate the paraphrasing program as part of a total instructional unit, the following sequences are suggested: (1) explain to students why the paraphrasing skill is important and how it may be used, (2) have students match pictures with sentences that give the same idea, (3) give sets of synonyms to be matched by students, (4) have students match short phrases with a single word, (5) have students compare direct and indirect quotes, (6) make use of the computer program, (7) have students summarize ideas in a few sentences, and (8) have students look up information on a topic and take notes. (HOD)

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Development and Use of Microcomputer Reading Programs

By Maribeth Henney

Of the currently available programs for microcomputers, only a small percentage are applicable for reading instruction. Those being used are most frequently drill and practice type programs. Reading skills easiest to program appear to be such things as letter recognition, alphabetical order, word alphabetization, sight words, phonics, structural analysis, word definition matching, and synonym or antonym matching. One may note the commonality in all of these is the use of convergent thinking, allowing the programing to be rather straightforward. Many of these programs do little more than what could have been done as well on paper. Very few programs are concerned with comprehension, which requires more flexibility in content and response.

Programs may not meet the curricular needs of teachers. One reason may be that the programs were not authored by educators but were more likely to have been authored by computer science experts who needed some content to demonstrate the capabilities of the microcomputer. Teachers who want to use the microcomputer as part of their instruction may not really be familiar with all of the things which may be done through a program. They do not have time to become competent in a programing language. Yet they do know what their children need in terms of appropriate instruction.

In order to develop relevant, well-written programs, a team

CS006595

approach is necessary. One member would be someone with an idea for content and skill, probably the classroom teacher who has actual contact with students. Another member would be the designer, who knows the capabilities of the machine and language and works with the idea person to implement the content and skill in the most effective way. Lastly, the programer, who is skilled in the language, writes the program in such a way as to implement the ideas and structure given him by the other two team members.

This model would result in the most effective use of the microcomputer to provide a learning experience for students which would be meaningful in terms of what they are learning through other avenues. And it makes efficient use of the skills and expertise of the personnel involved in the program development. Obviously it is a rare individual who has well developed competence in all of these areas.

Model Application

A team such as that described above produced several microcomputer programs as Iowa State University (Ames). The members were several teaching faculty from the Elementary Education Department (including the author), a media specialist, and two programers. One programer was an elementary school principal, which facilitated a tie-in between the "idea" and "programing" people. The other was a computer science student. This team worked together for only one month.

Although five programs were developed during that time, only one will be discussed in this paper, one authored by this writer. The foremost goal was to develop a program which was more than drill and practice, but rather one to provide instruction about the

concept. A comprehension skill was selected, since few programs are available in this area. The skill was paraphrasing, that is, saying things in other words.

The program is designed for use on the Apple II Plus microcomputer. The readability of the program is approximately fifth-sixth grade level. The program is in two parts, one using regular sentences and the other using sentences with idioms. The format for both parts is identical. In each part are 15 sets of three sentences each. Two of the sentences in each set express basically the same idea, thus, are paraphrased. The student is to read all three sentences and select the two giving the same thought. After selecting his answer, he will be told if he is right. If so, a colored block from a stack of 15 blocks will move across the screen and drop in an area marked "First Answer Correct." If his answer was not right, he will be shown a screen with the three sentences with key words of each sentence given below the sentence. He is told to study these clues and then try again. The three sentences are again shown. If he answers right, the colored block moves to an area marked "Right Second Time." If, on the second attempt, the student still answers incorrectly, the two correct sentences are shown along with an explanaton of why they are the same and why the other one is different. The colored blocks show "No Change." Upon completion of the 15 sentences, the student is shown his percentage correct on the first try and second try, and for ones missed.

Program Use

A problem with computer education is that programs are too frequently used as isolated activities for children to do--for fun,

as time fillers, to have experience with the computer, or as a reward for getting work finished or for behaving. These are not constructive uses of computers in education; yet too many times these are the only reasons children are allowed to interact with the computer.

If computer education is to develop a respectable image, educators must examine their beliefs about how and why computers should be used in the schools. Computer programs should be used as an integral part of other instruction and study.

The computer program may be used as an introduction to a topic to be studied with the teacher later. The student may use the program to explore a concept and learn intuitively from the experience. Class instruction may later help him formalize his thinking. In some cases, class instruction may precede computer work, with the teacher providing basic information and structure, followed by practice with the skill or the concept. Some programs may be complete enough to teach by themselves, with no direct teacher instruction needed.

The paraphrasing lesson described previously could be used either prior to instruction as an introduction to the concept, or after class instruction for additional practice.

To demonstrate how a computer program may be integrated as part of a total instructional unit, the following sequence is suggested for using the paraphrasing program.

A. Explain to students why the paraphrasing skill is important and how it may be used. Tell possible situations in which paraphrasing would be useful.
B. Have students match pictures with sentences which give the same idea.

C. Give sets of synonyms to be matched by students.

D. Have students match short phrases with a single word (undress--take off my clothes).

E. Have students compare direct and indirect quotes.

F. Use of computer program described in this paper.

G. Using written paragraphs, students summarize ideas in a few sentences.

H. Students look up information on a topic and take notes.

If a teacher were to teach paraphrasing through such activities, the computer program would be viewed by the students as a meaningful learning activity, participated in by all students, not as an isolated "something to do on the computer."

In order for computer programs to be used in an integrated way, programs which are sold should be accompanied by printed materials to provide ideas for using the programs within a classroom. Those who author programs should state specific objectives, provide supplementary activities, and indicate readability and interest levels. It would also be desirable to indicate how the program ties in with certain parts of leading basal series, although this information might become quickly outdated as basals are revised. It is essential, however, that each school's teaching staff catalog existing computer programs according to whatever textbooks are used in the school, so programs may be readily accessed to be used in usual curriculum units in all areas of instruction.

Microcomputers are a tool found in most elementary schools. There are many questions to be answered about their use before their full contribution to education will be seen. In the

meantime, the development and use of programs should keep in mind what has been determined to be effective education. Teachers need to play a more active role in program development, by working cooperatively with people knowledgeable in computer science. Educators also need to select from among available programs those which are well-programed and which may be integrated as a meaningful supplement to current curriculum.

*Information about obtaining the paraphrasing program herein described may be obtained by contacting: Dr. Roger Volker; Instructional Resources Center; North Quad Building; Iowa State University; Ames, Iowa 50011.